

A focused particle beam system, according to one embodiment of the invention, precisely shapes a pole-tip assembly formed by a multi-layer device having a first layer with a first structural element, a second layer with a second structural element, and a shielding layer with a shielding element, the shielding element being located between the first layer and the second layer. The focused particle beam system mills the second structural element without irradiating a first structural element. The system images a selected portion of the multi-layer device to locate the shielding element and thereby avoids irradiating the first structural element. The shielding element separates the first structural element from the second structural element. Based on the location of the shielding element, the system images and mills the second structural element without irradiating the first structural element. In this manner, the focused particle beam system mills the second structural element to produce a desired pole-tip configuration. By producing a desired pole-tip configuration, these methods and apparatus produce a recording transducer capable of high storage density.